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AGRICULTURE

**in the
UNITED STATES**

**and the
SOVIET UNION**

ERS-Foreign-53

PREFACE

This report brings up to date and enlarges upon the material and analysis published in ERS-Foreign-9, "Comparison of Agriculture in the United States and Soviet Union," by Richard E. Bell, June 1961. Supplementary material is also included.

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SUMMARY

The United States and the Soviet Union, in addition to being the world's leading industrial nations, have long been the world's foremost agricultural countries, accounting together for more than one-quarter of the world's annual farm output. These two nations differ greatly in their climatic conditions, resource utilization, and in the organization and management of agricultural production.

American agricultural production is facilitated by a combination of favorable climate, effective institutional arrangements, superior technology, and much good agricultural land. Relatively small amounts of labor and large amounts of capital are utilized in the United States to produce an abundance of agricultural products. The standard production unit in the United States is the individual family farm of 300 to 400 acres producing for a market. High yields and efficient production on these farms result in a plentiful and diversified supply of food and fibers and, in some instances, surpluses of certain products.

The Soviet Union is situated much farther north than the United States and Soviet agricultural production is hampered by inadequate rainfall and low temperatures. However, the adverse effect of these conditions has been aggravated by various institutional and politico-economic factors. In the Soviet Union the standard production units are the large collective farms (averaging about 6,500 acres of sown area) and the gigantic state farms (averaging about 24,000 acres of sown area) both of which employ hundreds of workers. All land is nationalized, and agricultural production is predominantly collectivized. Agriculture is closely controlled and planned through a complex network of state and Communist Party organs and has been subject to heavy taxation in one form or another by the state. Partly as a result of this organization and partly because of the much higher priority given to industry, principally heavy industry, by the government in allocating resources, agricultural production in the Soviet Union has long suffered from insufficient capital inputs, low incentives to farm workers and managers, and inefficient farm practices. As a consequence, agricultural output in the Soviet Union has been typified by slow growth or stagnation especially in the output of livestock products and animal feed, which has impeded the progress of the entire economy. At the same time agriculture has been burdened with a large labor force which is inefficiently employed and earning relatively low incomes.

In the last decade since Stalin's death major changes have taken place in Soviet agriculture. Capital investment has been increased, the prices of many farm products have been raised substantially and the sown area, especially under wheat and corn, has expanded greatly. These measures, coupled with many other changes, and favorable weather conditions resulted in rapid increases in agricultural production up to 1958. Since 1958, however, with less favorable weather, and a slowdown in the aid to agriculture, production has again stagnated. The great increase in output called for in the 7-year Plan, 1958-65, and on which improvement in the standard of living depends, have not materialized. This has impelled the Soviet Government to raise prices of animal products again--and this time also retail prices for animal products, to increase investment, to carry out a new administrative reorganization aiming at a tighter control of agriculture, and to undertake a vast restructuring of the sown area in order to increase production of more intensive feed crops.

AGRICULTURE IN THE UNITED STATES AND THE SOVIET UNION

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INTRODUCTION

This report is designed to compare agricultural conditions and production in the United States and the Soviet Union, utilizing current statistical information. It compares general features of climate, soils, land utilization, capital and labor inputs, and agricultural organization and management. It provides in tabular form a comparison of sown area, yields, and production of a large number of crops, as well as of livestock and livestock products.

The statistical data in this study have been computed by analysts in the United States Department of Agriculture unless otherwise noted. Almost all Soviet data have been taken from official Soviet sources; however, these data are converted into U. S. measurement units. In certain cases U. S. Department of Agriculture (USDA) estimates have been substituted for Soviet figures where analysis has shown the Soviet figures to be inconsistent with available information.

Sources of information for this report are listed in the back of the report under the heading Literature Cited.

RESOURCES

Land Area

Although the Soviet Union possesses a land area more than twice that of the United States (including Hawaii and Alaska)--5.5 billion acres in the USSR compared to 2.3 in the US--the Soviet Union's area of cropland, including hayland, exceeds that of the United States by only about 40 percent. The Soviet Union has approximately 650 million acres of crop and hayland, as compared with about 460 million acres in the United States. The United States, however, probably has more land suitable for tillage than the Soviet Union. In 1961 the United States planted 310 million acres to crops, compared to 505 million acres sown in the Soviet Union (table 1). The sown area in the United States has been declining steadily for the past three decades from a peak of 375 million acres in 1932 (8, pp. 15-16). 1/ As productivity per acre has increased in the United States, land has been taken out of cultivation. In the Soviet Union, however, the sown area has been steadily increasing--140 million acres between 1950 and 1960--as more and more marginal land is brought into cultivation.

Soils

The many soil types found in the vast land area of the Soviet Union are distributed in rather well-defined zones or belts ranked from north to south and stretching across the country from east to west. Beginning in the north these zones are the tundra, with little vegetation,

1/ Underscored numbers in parentheses refer to Literature Cited on page 24.

Table 1.--Agricultural resources in the United States and the Soviet Union

Item	Year	Unit	United States <u>1/</u>	Soviet Union <u>2/</u>	USSR as percent of US
Population	Jan. 1962	Millions	185	220	119
Population	Jan. 1959	do.	176	209	119
Labor force	Jan. 1959	do.	69.4	3/105.4	153
Farm labor force	Jan. 1959	do.	7.4	3/48.3	653
Percent farm of total labor force	Jan. 1959	Percent	10.7	45.4	0
Sown cropland	Jan. 1961	Mil. acres	310	505	163
Sown cropland per capita	Jan. 1961	Acres	1.7	2.3	135
Tractors on farms	Jan. 1961	Thousands	4/4,700	1,168	25
Motor trucks on farms ..	Jan. 1961	do.	4/2,850	790	28
Grain combines on farms	Jan. 1961	do.	4/1,035	503	49
Agricultural consumption of electricity	Jan. 1960	Bil. kwh.	5/31.7	6/9	28
Fertilizer consumption in terms of available plant nutrients	Jan. 1961	1,000 tons	7,765	2,964	35

1/ Unless otherwise indicated data for the United States are taken from (7, 8, 18).

2/ Unless otherwise specified, the major Soviet sources are (19, 21, 22).

3/ Includes members of collective farm households and other workers' families engaged in individual and subsidiary production.

4/ (8, p. 35). Tractors include: Wheel, including homemade, 4,495,000; and crawler, 205,000; excluding garden tractors, 468,000. Truck series for previous years reduced on basis of 1960 census.

5/ Federal Power Commission Release No. 11,829, Washington, D. C. 1962.

6/ Sel'skaya Zhizn, Sept. 8, 1961.

then the forest zone occupying more than one-half the USSR, with light gray podsolized soils. The forest zone fades into the wooded steppe zone followed by the steppe zone with the chernozem and chestnut soils, and finally the desert zone in the extreme Southeast--Soviet Central Asia. Although the Soviet Union possesses a gigantic land area, one-sixth of the earth's land surface, agricultural land is a relatively small proportion of this total--only 10 percent of the land is classified as arable (16, p. 10). The agricultural area is often spoken of as the "fertile triangle" which extends from Leningrad in the north-west along the western boundary of the USSR to the Black Sea in the south and stretches eastward into Siberia as far as the Enisey river.

The chernozems (black soils) are the most important, both chemically and physically, for growing crops, but comprise less than 11 percent of the total territory. They are found in the steppes and wooded steppe zones of central and southern European Russia and in southwestern

Siberia and northern Kazakhstan (6). Much of the important wheat crop is grown on these chernozem soils. The Soviets have no areas to compare with the US corn and cotton belts in their combination of soils and climate.

Climate

Climate in the Soviet Union is a greater limiting factor for increasing agricultural production than soil or land resources. While all of the continental United States lies south of latitude 50° N, most of the Soviet Union is located north of this line. (See map pp.10-11.) Thus, most of the Soviet Union lies north of the southern boundary of Canada, yet the lesser portion of the country lying south of the 50th parallel is the most important agricultural area. Even the southernmost part of this area in European Russia--the southern tip of the Crimea--is in the latitude of Minneapolis, Minn.

The northerly location of the Soviet Union coupled with the extreme continentality of much of its territory contributes to the severity of its winters and insufficiency of precipitation. Continentality results in extreme differences in temperature between winter and summer as well as rapid changes in temperature. In the north, moisture is sufficient but temperatures are often too low for crop production. In the south, temperatures are adequate for crops but moisture is often insufficient. The average growing season, indicated roughly by the frost-free period, is short even in central and southern Russia. In Moscow it is around 130 days, about the same as in central North Dakota. As far south as Krasnodar in the North Caucasus, the growing season is only 190 days, similar to that of east-central Kansas (6, 26).

Population

On January 1, 1963, the population of the Soviet Union was estimated by the Soviets to be 223.4 million. The population of the United States on that date was estimated by the United States Government to be about 188 million persons. Within the last two decades the population of the United States has gained significantly on that of the Soviet Union. Prior to World War II the Soviet population was more than 45 percent larger than the US population, but now it is less than 20 percent larger. This is due to losses sustained by the Soviet Union during World War II, estimated at about 20 million, and also to an increase in the birth rate in the United States. War losses in the Soviet Union resulted in an imbalance between men and women in the Soviet population. In 1959 there were 82 men per 100 women in the Soviet Union and in the United States there were 98 men per 100 women.

In both countries urban and suburban population has grown rapidly, but precise comparisons are impossible because of differences in classification and composition. In 1962, 49 percent of the Soviet population was still rural, i.e., lived in villages, but less than 30 percent of the United States population was so classified (18, 21).

Labor Force

The Soviet Union has a larger labor force than the United States. According to the Soviet census for 1959, the number of persons employed in the USSR, excluding those in the military, was 95.5 million. However, this figure does not include 9.9 million members of collective farmers' and workers' families engaged in individual agricultural production. If they are included, the total Soviet labor force would have been 105.4 million persons in 1959 (19). The US civilian labor force in 1959 was 69.4 million according to the US Department of Labor.

Comparisons between the farm labor force in the United States and the Soviet Union are rendered difficult because of differences in terminology and classification. The 1959 Soviet census provides the most detailed recent information available and for that reason the labor force comparisons in this study are based on 1959 data.

The annual Soviet statistical handbook (Narodnoe Khozyaistvo SSSR) gives a figure for employment in agriculture which is described as the "annual average number of persons employed in agriculture." This annual average employment in agriculture was 31 million persons in 1961 (21, p. 461) and 33 million in 1959 (22, p. 450). This figure is apparently an average of the very large employment in agriculture during the summer months and the much smaller employment during the winter months. As a consequence this average figure greatly understates the total employment in agriculture during any one year.

According to the 1959 census there were 38.4 million people employed in agriculture in the Soviet Union, not including 9.9 million members of collective farm households and of other workers and employees occupied in individual agricultural production. Combining these two figures, the total agricultural labor force in 1959 was 48.3 million persons. Since the average 33 million persons mentioned in the handbook for 1959 also included all persons who worked any length of time at all, the difference between the total and this low average reflects the great seasonal fluctuations in Soviet agricultural employment.

These 48.3 million persons can be compared with the 7.4 million workers in United States agriculture in 1959, which include farm operators, unpaid family workers, and hired workers.

By 1962 the United States farm labor force had declined to 7 million persons; the total Soviet agricultural labor force may have also declined slightly, although it remained almost constant between 1950 and 1959. At the present time one agricultural worker in the United States supplies food and fiber for himself and 25 other Americans. In the Soviet Union one agricultural worker supplies himself and only 2-1/2 other Russians if one takes the annual average agricultural labor force of 31 million and one Russian supplies himself and 3-1/2 others if one takes the total agricultural labor force of about 48 million.

The numerical imbalance between sexes in the population of the Soviet Union is reflected in the Soviet labor force, which consists of 48 percent women, and in the total number of Soviet farm workers, 60 percent of which are women. Much of the laborious field work in Russia is done by women, while men hold most of the managerial and technical positions. In the United States, women comprise about one-third of the total labor force, but less than one-fifth of the farm labor force.

The great disparity between labor inputs in agriculture in the two countries is illustrated by a Soviet estimate of man-hours required to produce the same quantity of output in the United States and in the Soviet Union (table 2).

Another revealing comparison of the use of labor in these two countries is that of labor inputs in harvesting and threshing of grain. A 1953 study revealed that 24 bushels of grain per man-hour were harvested by an average combine in Nebraska while only 2.5 bushels per man-hour were obtained on a better-than-average combine on a collective farm in the Soviet Union. In threshing, the ratio of output per man-hour in the US as compared to the USSR collective farm was about 14 to 1 (3). A major reason for these high labor inputs is the relative

Table 2.--Average man-hours required to produce 100 pounds of agricultural commodities in the United States and in the Soviet Union
(US: 1956; USSR: 1956-57) 1/

Commodity	Man-hours expended per 100 pounds of production			Number of times USSR's man-hour requirements exceed those of US	
	On US farms	USSR state farms	USSR collective farms	State farms	Collective farms
Grain	0.45	0.85	3.31	1.8	7.3
Potatoes	0.45	1.91	2.31	4.2	5.1
Sugarbeets	0.22	0.95	1.41	4.2	6.2
Cotton (unginned).....	8.52	13.52	19.41	1.6	2.3
Milk	2.13	4.50	6.66	2.1	3.1
Livestock (gain in weight):					
Cattle	3.58	23.58	50.80	6.6	14.2
Swine	2.86	19.50	46.72	6.8	16.3

1/ (22, p. 449). The original Soviet data were in man-hours per centner (220.46 pounds) of production.

scarcity of capital in the USSR. However, this scarcity in agriculture is to a considerable extent the result of channelling capital into industry rather than into agriculture. Furthermore, despite the natural scarcity relationships in the Soviet Union, labor is inefficiently managed and utilized.

Capital

The Soviet Union has much less capital employed in agriculture than the United States. This is reflected partly in the very high labor inputs per unit of output as evidenced in table 2. In the production of cotton and grain on state farms in the Soviet Union the capital inputs are relatively large and, as a result, the labor inputs per unit of output do not exceed those in the United States by as much as they do elsewhere. However, in the commodities and sectors of agriculture where capital inputs are relatively low--on the collective farms in general, and in livestock production in particular--the labor inputs are exceptionally large when compared with the United States.

This shortage of capital in Soviet agriculture is a function of a relatively small stock of capital and, until recently, very small annual increments to capital investment in agriculture.

During the last decade the annual additions to capital in agriculture have increased substantially (20, p. 152). The stock of capital, however, remains relatively small. In 1961, there was one tractor for every 432 acres of sown area in the Soviet Union compared with one tractor for every 66 acres of sown area in the United States. In 1959, the consumption of commercial fertilizer in terms of available plant nutrients was 51.1 pounds per acre of sown area in the United States and only 11.7 pounds in the Soviet Union.

One indication of the comparative amounts of capital equipment available to the agricultural sectors of the two countries can be obtained from the data in table 3, keeping in mind that the Soviet Union has about 60 percent more land in crops.

Table 3.--Selected machines: Number on farms,
United States and Soviet Union, 1962

Machines	United States	USSR 1/	
	Jan. 1, 1962 2/	Jan. 1, 1962	Requirements 3/
	Thousands	Thousands	Thousands
Tractors	4,660	1,168	2,696
Grain combines	1,025	503	845
Silage harvesters	320	121	257
Trucks	2,875	790	1,650
Tractor trailers.....	4/4,400	292	820
Tractor-drawn plows	4/3,555	784	1,180

1/ Pravda, Mar. 6, 1962.

2/ (8, p. 34)

3/ For performance of farm operations during optimum periods.

4/ Jan. 1, 1957 (11.)

Electrification

The USSR is the second largest power-producing nation in the world, with about one-third the power capacity of the United States (2, p. 38). In 1960, 96.5 percent of American farms received electric services (7, p. 580). During the past two decades, especially during the period between 1945 and 1950, the changes in electrification in American agriculture have been substantial. In 1940 only 2 million American farms possessed electricity, but by 1950, 4.4 million American farms had it (17, p. 534). Electricity is used extensively today on American farms for the household and also for farm power, such as for pumping and feed grinding.

In the Soviet Union, although electrification of agriculture has progressed fairly rapidly, increasing from .5 billion kilowatt hours in 1940 to 9 billion in 1960 (5), the amount of electricity and its general use on farms is still very limited. According to Soviet statistics 96 percent of

the state farms and 61 percent of the collective farms were electrified in 1959 (22, pp. 428 and 432). The meaningfulness of these percentages is, however, seriously modified by two factors. First, much of the electricity available to Soviet agriculture comes from small on-farm power stations which are relatively expensive and totally inadequate for the needs of agriculture. 2/ Second, the Soviets themselves often complain that a farm is classified as electrified if it has some form of electric power available, no matter how inadequate that power may be. At the present time electricity in Soviet agriculture is used only to a limited degree in households and for agricultural production.

AGRICULTURAL ORGANIZATION

In the United States agriculture is characterized by a large number of individual farmers who own their land and operate their own family-sized unit. In the Soviet Union all land is nationalized and the operational unit is predominantly a large collective farm, or an even larger state farm. These replaced the millions of small individual peasant farms prevalent in Russia until 1930.

Farm System and Numbers

The United States had 3.7 million farms in 1960, of which 2.4 million were commercial farms (as defined in the 1959 Census of Agriculture), and they accounted for over 95 percent of all farm sales by farmers. The vast majority of these were family farms employing one hired worker or less. The Soviet Union had 53,400 collective farms and 6,500 state farms in 1960, compared with more than 250,000 collective and about 5,000 state farms a decade earlier. These changes are the result of amalgamation of smaller farms and conversion of collective to state farms. By January 1, 1962, the number of Soviet state farms had increased to 8,300 and the number of collective farms had further decreased to 41,300 (21, p. 291).

The Collective Farm

The collective farm, or kolkhoz, is the dominant form of Soviet agricultural unit and consists of pooled holdings created by the forced collectivization of formerly independent small peasant farmers. In 1960 collective farms accounted for more than 60 percent of the total sown area, a decline since 1953, when they accounted for 84 percent of a smaller sown area. The share in the total sown area in collective farms is declining, partly due to the conversion of collective farms into state farms, and partly as a result of the opening up of "new lands" which, for the most part, were organized into state farms.

The kolkhoz is supposed to be a form of producers' cooperative, electing its own management. In actuality, it is tightly controlled by the Soviet Government and in this respect is practically indistinguishable from other state enterprises. In 1962 the Soviet Government practically reversed the attempted policy of encouraging greater autonomy and individual initiative in collective farm management, which dates from the mid-fifties. Now the role of the Communist Party has been greatly expanded and Party officials play an increasingly important part in all phases of agricultural production, including collective farm management.

Unlike workers in other state enterprises, collective farmers are residual claimants on the income of the collective. After the claims of the state and production expenditures have

2/ Khrushchev, Pravda 30 July 1962.

been met, and a certain amount of the farm's income has been set aside for investment, the remainder is distributed to the collective farmers. This income is both income in kind--direct distribution to collective farmers of products produced on the collective farm--and money income. Thus the income of the collective farmers varies with the "profitability" or "unprofitability" of the collective farm. In addition earnings in kind and in cash vary with the skill and labor contribution of the peasants. The greater the skill required, as operating combines and tractors for instance, the greater the earnings of a collective farm member. In recent years steps have been taken to make payments to collective farmers on a quarterly and even monthly basis, and to make a greater share or all of the income payments in money rather than in kind. The state shares in the income of the collectives through planned deliveries (purchases) of farm products at fixed prices which have the first priority in the distribution of the collective farm income (26).

The State Farm

The state farm, or sovkhoz, is a state owned and operated "agricultural factory." Ideologically it is considered the "highest" form of socialized agricultural unit, and the ultimate aim is to have all agricultural production carried out on such farms. State farm workers are paid regular wages similar to factory workers. In 1960 the state farms accounted for a third of the total sown area.

The favored position of state farms in Soviet agriculture is reflected in many ways. They receive most of the state capital investment in agriculture. Production on state farms is subsidized and if a state farm operates at a loss this loss is made up by the state. When the New Lands were opened in southwestern Siberia and Kazakhstan, state farms were the dominant form of agricultural unit established. Many collective farms in recent years were converted into state farms. State farms are more specialized than collective farms. For example many livestock, dairy, and vegetable state farms have been established around urban centers in recent years. This favored position, especially in regards to capital investment, is reflected in higher productivity on state farms than on collective farms and in lower labor inputs per unit of output.

A noticeable disappearance from the Soviet agricultural scene is the MTS (machine-tractor stations) or their partial successor, RTS (repair-technical stations). Until 1958 the MTS, which were state owned centers of tractors, machinery, and skilled operators, controlled the cultivation and harvesting of crops on collective farms wherever mechanical operations were involved. They were also an important source of acquisition of farm products for the state, as they were paid for their operations by collective farms mostly in grain and other farm products. Once numbering almost 9,000, these machinery centers were disbanded or reorganized into RTS and dwindled to 2,900 RTS by January 1961. The last remnants were turned over to the Soyuzsel'khoztekhnika 3/ in 1961 (21, p. 568).

Since the decision to liquidate MTS in 1958, the machinery once held by them has been sold mainly to the collective farms. This has been both an advantage and a handicap to the collectives. On the one hand having their own machinery is an advantage, but the cost of obtaining this machinery and maintaining it places a heavy burden on the weaker collective farms. Furthermore, the collective farms are not well supplied with skilled and competent operators,

3/ The Soyuzsel'khoztekhnika is a new organization established for supplying agriculture with machinery, fertilizer, and other inputs.

repair men and spare parts and there are many reports that, as in the former MTS, much of the machinery goes unused for want of repair. The Soviet Government announced in January 1963 a new program for the purpose of creating on each collective and state farm a cadre of machine operators and mechanics.

Farm Size

Average farm size in the Soviet Union has increased considerably during the last decade. Soviet farms are gigantic when compared with United States farms and require subdivision into smaller operational units (table 5). In 1960 the average United States farm was 302 acres with an average of 84 acres of harvested cropland. This can be compared with an average of 6,785 sown acres on collective farms and 22,485 sown acres on state farms in the Soviet Union (table 4). In 1961 the sown area per Soviet collective farm declined slightly to 6,617 acres, but

Table 4.--Farms: Number and average size, in the United States and the Soviet Union, 1960

Farms:	:	<u>Number</u>
All US farms <u>1</u> /	:	3,700,000
US commercial farms <u>2</u> /	:	2,400,000
Soviet collective farms	:	3/53,400
Soviet state farms.....	:	<u>4</u> /6,500
Average farm size:	:	<u>Acres</u>
Land area per US farm	:	302
Sown area per US farm	:	89
Land area per US commercial farm	:	409
Sown area per US commercial farm	:	<u>5</u> /
Sown area per Soviet collective farm	:	<u>6</u> /6,785
Sown area per Soviet state farm	:	<u>7</u> /22,485
	:	<u>Number</u>
Workers per US farm.....	:	1-1/2
Workers per US commercial farm.....	:	<u>5</u> /
Households per Soviet collective farm.....	:	8/386
Workers per Soviet state farm.....	:	<u>9</u> /753

1/ According to the definition of a farm used in the 1959 Census of Agriculture.

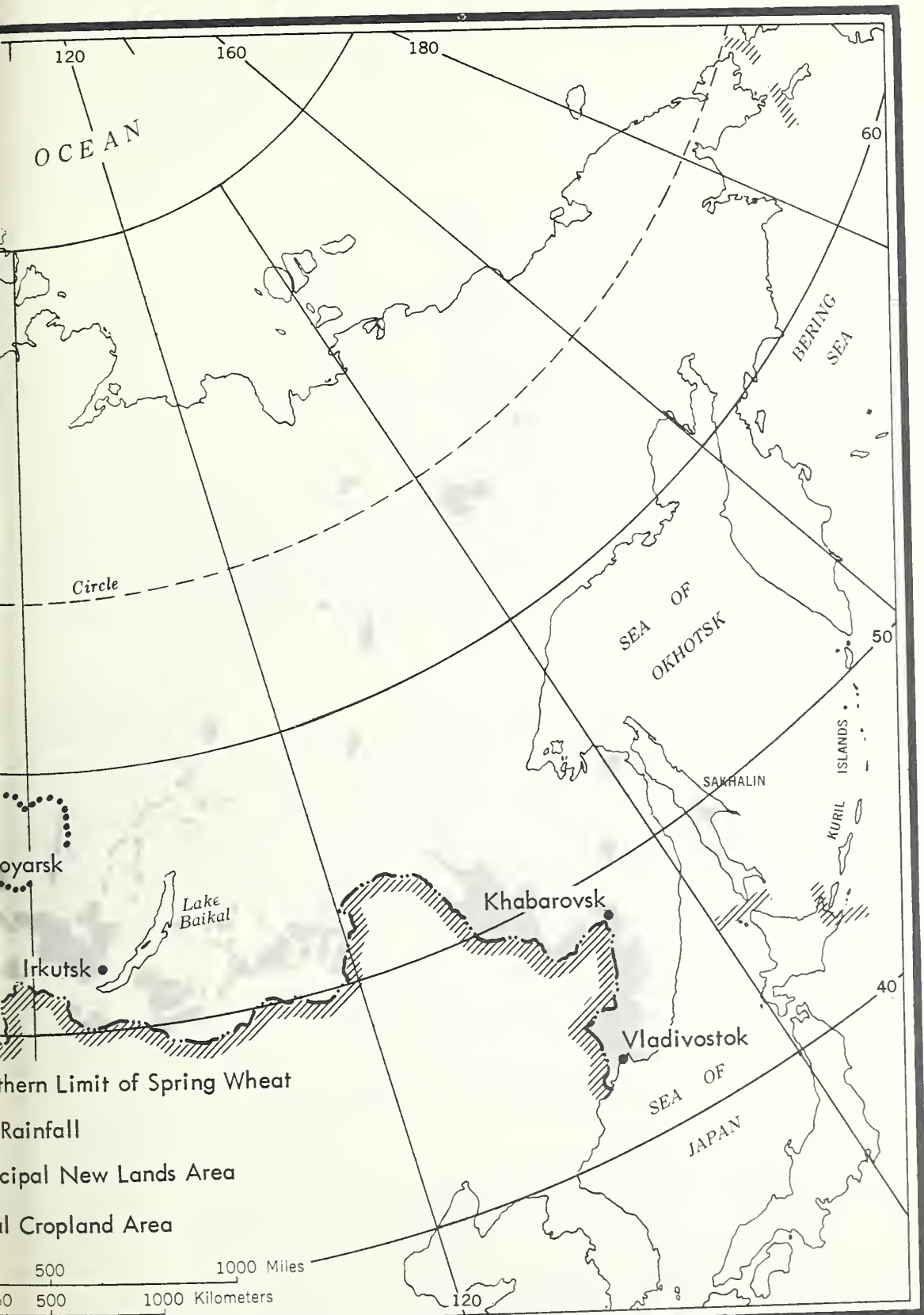
2/ Includes all farms with value of farm products sold totaling \$2,500 or more, and also farms with sales of \$50 to \$2,499 provided that the operator was under 65 years of age and he did not work off the farm 100 days or more and the income of the operator and members of his household from nonfarm sources was less than the total value of farm products sold. 3/ On Jan. 1, 1962, there were 41,300 collective farms. 4/ On Jan. 1, 1962, there were 8,300 state farms. 5/ Not available.

6/ In 1961 the sown area per Soviet collective farm was 6,617 acres. 7/ In 1961 the sown area per Soviet state farm was 23,884 acres. 8/ In 1961 there were 400 households per Soviet collective farm. 9/ In 1961 there were 785 workers per Soviet state farm.

Sources: US: (7, 18), USSR: (21).



U.S. DEPARTMENT OF AGRICULTURE



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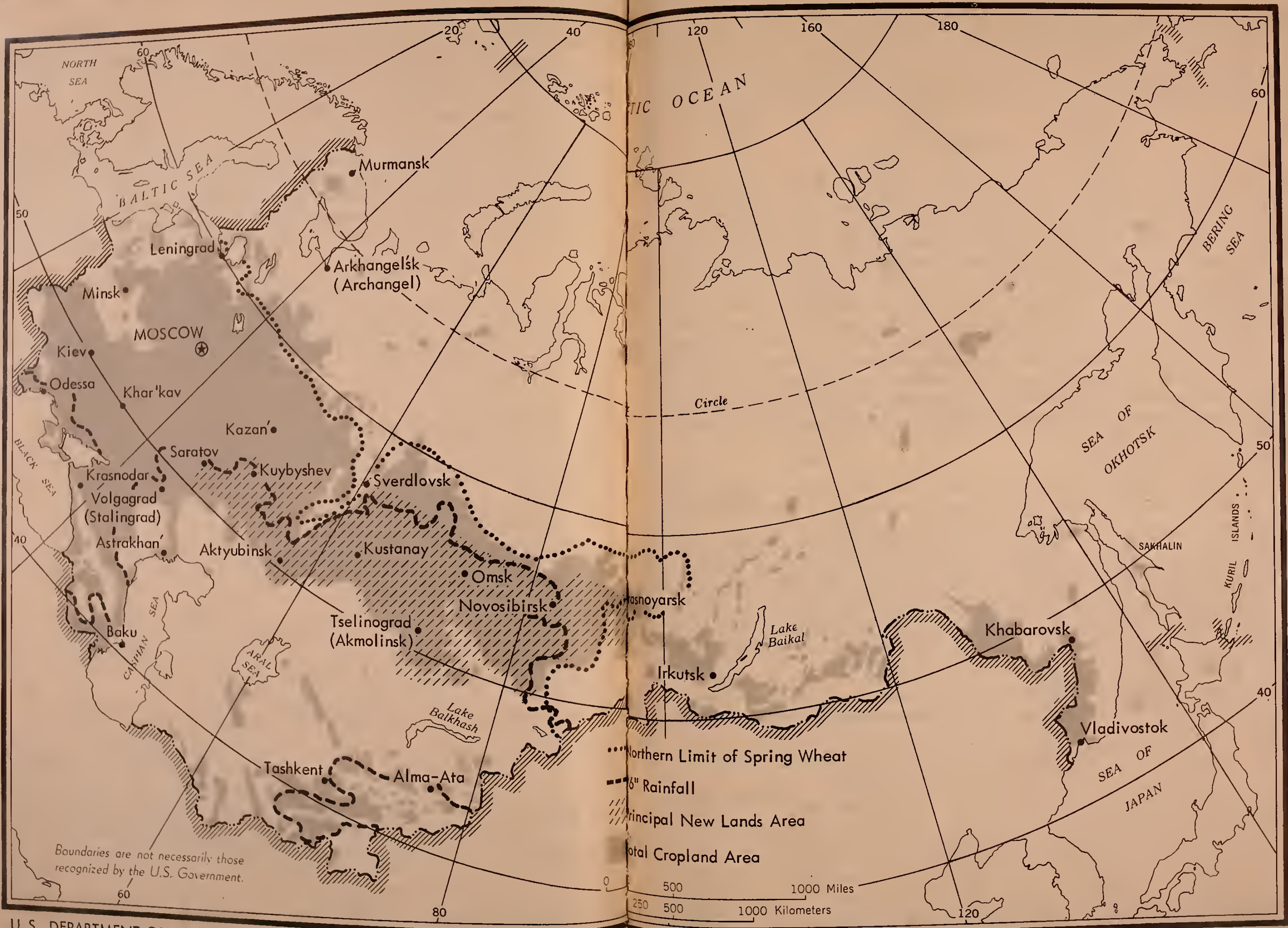


Table 5.--Size distribution of all farms in the United States and collective farms in the Soviet Union, 1959

United States farms <u>1/</u>		:	USSR collective farms <u>2/</u>	
Acres	Percent		Acres	Percent
Under 10	6.5	:	Under 247)	---
10 - 49	21.9	:	247 - 494)	7.8
50 - 99	17.8	:	494 - 741)	---
100 - 179	20.8	:	741 - 1,235	5.8
180 - 259	11.2	:	1,235 - 2,471	18.3
260 - 499	12.7	:	2,471 - 4,942	27.9
500 - 999	5.4	:	4,942 - 12,355	29.2
1000 and over	3.7	:	Over - 12,355	11.0

1/ (18, p. 610).

2/ (22, p. 53).

for state farms it increased to 23,884 acres. On the average, about 1-1/2 farm workers were employed on each US farm in 1960, while each Soviet collective farm contained 386 households and the average state farm employed 753 workers (21). In 1961 the number of collective farm households per collective farm and the number of workers per state farm increased (table 4).

Private Agriculture in the Soviet Union

The last vestiges of private farming in the Soviet Union are the tiny private plots that collective farm and state farm workers and other workers are permitted to maintain. On these plots, which have only about 3 to 4 percent of the sown area in the Soviet Union but a much larger proportion of the livestock (for which some feed is obtained from the collective farms) no less than 30 percent of total agricultural production is produced (4). The bulk of the agricultural commodities produced on the private holdings are high value products. In 1961 the private sector produced, according to official statistics, 46 percent of the meat, 45 percent of the milk, 78 percent of the eggs, 64 percent of the potatoes, and 45 percent of the vegetables (21, p. 304). A considerable portion of the individual collective farmer's money income is derived from the sale of the produce from these plots.

In the two decades between 1940 and 1960 the relative importance of the private sector in agricultural production has declined considerably as is demonstrated in the following table:

Table 6.--Production of meat, potatoes, milk, vegetables, and eggs in the Soviet Union accounted for by the private sector

Year	Meat	Potatoes	Milk	Vegetables	Eggs
			Percent		
1940	72	65	77	48	94
1953	51	72	66	48	84
1960	41	63	47	44	80
1961	46	64	45	45	78

1/ (21, p. 304).

This decline is primarily due to the increase in production on collective and state farms, and not because of absolute declines in private sector production. It is the policy of the Soviet Government that these private holdings will eventually "wither away" as collective and state farm production expands and improves. At the present time the private sector contributes substantially to total agricultural production, especially of livestock, dairy, and truck garden products.

AGRICULTURAL PRODUCTION

During 1958, the most recent year for which U. S. estimates of world comparative data are available, Soviet farm production accounted for roughly 10 percent and United States farm production 16 percent of total world agricultural production. The net output of farm commodities in the USSR during that year was roughly estimated at about two-thirds of the United States level. On a per capita basis, however, this Soviet output is reduced to about half the United States level (15). Since 1958, a year of exceptionally favorable weather for Soviet agriculture, Soviet net agricultural production has declined, especially in per capita terms. United States agricultural production on the other hand has continued its steady increase since 1958 (14). Thus a 1958 comparison between the two countries favors the Soviet Union, the total agricultural production of which is probably no more than 60 percent of that of the United States.

The following three tables present comparisons of sown area, yields, and production for a wide variety of specified crops in both countries. A look at these three tables illustrates much that has been said above and places in stark relief the great differences in agricultural efficiency between the two countries.

Sown Area

There are many crops which play an important role in one country, but are of little or no significance in the other. The Soviet Union plants a far greater proportion of its crop land to wheat, rye, and potatoes, than the United States does, and these commodities play a much larger role in the basic Soviet diet than in that of the United States. Although more and more corn is being grown in the Soviet Union, the lack of know-how and favorable climatic conditions impedes the spread of this crop. Soybeans are the major oilseed crop in the United States but are of minor significance in the Soviet Union. Conversely sunflowers are the major oilseed crop in the Soviet Union but are of negligible importance in the United States. A far greater amount of land is sown to sugarbeets and flax in the Soviet Union than in the United States, while the reverse is true of cotton and rice. Peanuts, grain sorghum, and citrus fruit are important in the United States but are insignificant in the Soviet Union. Sugarcane is grown in the United States, but not in the Soviet Union while the reverse is true of tea (table 7).

Crop Yields

With the exception of cotton the yields per acre in the Soviet Union are about half those obtained in the United States (table 8). ^{4/} Even in those commodities which are of relatively

^{4/} Higher yields of cotton per acre are reported in the Soviet Union than in the United States because all Soviet cotton is grown on irrigated land while only 25 to 30 percent of the United States harvested cotton acreage is irrigated. In areas of the United States where irrigated cotton predominates the yields are above those in the USSR approximately 50 to 70 percent.

Table 7.--Crop acreages in the United States and the Soviet Union

Crop	Year	United States <u>1/</u>	Soviet Union <u>2/</u>	USSR as percent of US
		1,000 acres	1,000 acres	Percent
Corn for grain	1961	58,449	17,791	30
Wheat	1961	51,551	156,000	303
Rye	1961	1,550	42,000	2,710
Oats	1961	23,994	28,400	118
Barley	1961	12,946	33,100	256
Grain sorghum	1961	10,957	<u>3/</u>	---
Rice, rough	1961	1,589	247	15
Cotton, ginned	1961	15,634	5,757	37
Soybeans for beans	1961	27,008	<u>3/</u>	---
Soybeans for beans	1959	22,631	1,124	5
Sunflowers	1961	<u>3/</u>	10,403	---
Peanuts picked and threshed	1961	1,429	<u>3/</u>	---
Flax <u>4/</u>	1961	2,514	<u>3/</u>	---
Flax <u>4/</u>	1959	3,015	4,570	152
Hemp fiber	1961	<u>3/</u>	741	---
Sugarbeets	1961	1,077	7,709	718
Sugarcane, for sugar and seed	1961	363	<u>3/</u>	---
Tobacco	1961	1,174	5/255	21
Makhorka	1961	<u>3/</u>	5/115	---
Potatoes	1961	1,496	21,991	1,470
Sweetpotatoes	1961	197	<u>3/</u>	---
Vegetables	1961	3,480	6/3,459	99
Citrus	1960	779	<u>3/</u>	---
Other fruits and berries	1960	7/1,808	7/4,537	251
Tea	1960	<u>3/</u>	159	---
Hay	1961	67,085	<u>3/</u>	---

1/ (7, 9).

2/ (21).

3/ Not available.

4/ Flax for seed in the US; for both seed and fiber in the USSR.

5/ USDA estimate.

6/ Area of commercial crops of principal vegetables.

7/ Bearing acreage.

less significance in the United States than in the Soviet Union, for example flax and sugarbeets, the yields in the United States surpass those obtained in the Soviet Union.

Crop Production

In table 9 the results of high yields in the United States are evident. On three times the sown area the Soviet Union obtains only 50 percent more wheat than the United States. On three times the corn acreage the United States obtains 7 times the corn production. For almost all crops which are grown in both countries, the United States obtains far higher output on less land. Thus, although the land and labor inputs in the United States are far smaller than in the Soviet Union the resultant total production is much larger.

Table 8.--Yields per acre of major crops in the United States and the Soviet Union

Crop	Year	Unit per acre	United States	Soviet Union	USSR as percent of US
Corn for grain	1961	Bushels	64.1	1/29.0	45
Wheat	1961	do.	24.0	1/12.3	49
Rye	1961	do.	17.7	1/14.6	82
Oats	1961	do.	42.2	1/22.1	52
Barley	1961	do.	30.6	1/18.3	60
Grain sorghum	1961	do.	43.8	2/	---
Rice	1961	Pounds	3,411	1,837	54
Cotton, ginned 3/.....	1961	do.	438	597	136
Soybeans for grain	1961	Bushels	25.2	2/	---
Soybeans for grain	1959	do.	23.7	7.3	37
Sunflower seed	1961	Pounds	2/	1/890	---
Flaxseed	1961	Bushels	8.8	3.9	44
Sugarbeets	1961	Tons	16.4	7.30	44
Tobacco	1961	Pounds	1,755	1/939	54
Makhorka	1961	do.	2/	1/1,260	---
Potatoes	1961	Cwt.	196.3	84.7	43

1/ USDA estimates of Soviet yields.

2/ Not available.

3/ All cotton in the USSR is grown on irrigated land while only 25 to 30 percent of all US cotton is irrigated. Areas of the United States such as California, where irrigated cotton predominates, the average yield is about 900-1,000 pounds per acre.

Sources: US: (9). USSR: (21) except for USDA estimates.

Livestock Numbers and Meat Production

In recent years, according to Soviet data, livestock numbers in the Soviet Union have increased considerably by comparison with the United States (table 10). The growth in livestock numbers claimed by the Soviet Union is impressive, but it raises a number of questions. The livestock feed supply in the Soviet Union has been insufficient for a number of years. This has been acknowledged many times by Soviet leaders. The feed supply has not increased appreciably in the past 3 years and as a result both the average liveweight of slaughtered animals and milk production per cow have declined (21, p. 407-8, 22, 371-2). Furthermore, meat production in the past few years has not increased as rapidly as livestock numbers (tables 10 and 12). A new program was initiated in 1962 to expand the supply of livestock feed, through the plowing up of over 100 million acres of grasses and fallow, and planting this land to more intensive feed crops such as sugarbeets, corn, beans, and peas. This program will entail an added strain on the already short supplies of machinery and fertilizer in the Soviet Union and calls for a substantial increase of crop yields per acre, which past experience shows to be a difficult task.

It is not unreasonable to expect meat production to remain static or grow slowly while livestock numbers are being built up, as is being done in the Soviet Union, but there are further complications. There is a strong desire on the part of Soviet leadership to increase livestock numbers with penalties for managers who fail to do so. As a result, throughout the Soviet Union

Table 9.--Crop production in the United States and the Soviet Union

Crop	Year	Unit	United States	Soviet Union	USSR as percent of US
Corn for grain	1961	1,000 bu.	3,625,530	1/500,000	14
Wheat	1961	do.	1,234,743	1/1,918,000	155
Rye	1961	do.	27,476	1/600,000	2,183
Oats	1961	do.	1,011,398	1/600,000	59
Barley	1961	do.	395,669	1/610,000	154
Grain sorghum	1961	do.	479,751	2/	---
Rice, rough	1961	1,000 tons	2,710	264	10
Cotton, ginned	1961	1,000 bales	14,378	1/7,060	49
Soybeans	1959	1,000 bu.	579,566	8,230	1
Sunflower seed	1961	1,000 tons	2/	1/850	---
Peanuts, picked and threshed	1961	do.	871	2/	---
Flaxseed	1959	1,000 bu.	22,178	15,550	70
Hempseed	1959	1,000 tons	2/	34	---
Sugarbeets	1961	do.	17,704	1/56,100	317
Sugarcane, for sugar and seed	1961	do.	9,991	2/	---
Sugar production	1961	do.	3/5,481	4/7,300	134
Tobacco	1961	1,000 lb.	2,060,992	1/239,500	12
Makhorka	1961	1,000 lb.	2/	1/145,500	---
Fiber flax	1961	1,000 tons	2/	440	---
Hemp	1959	do.	2/	251	---
Potatoes	1961	1,000 cwt.	293,594	1/1,672,000	569
Sweetpotatoes	1961	do.	15,213	2/	---
Vegetables	1961	1,000 tons	5/18,876	17,195	91
Citrus	1960	do.	7,638	2/	---
Grapes	1960	do.	2,997	2,062	69
Total fruits (including citrus, grapes and berries).....	1960	do.	6/17,019	5,447	32
Tree nuts	1961	do.	355	2/	---
Tea	1960	do.	2/	180	---
Hay, all kinds	1959	do.	113,650	88,674	78

1/ USDA estimates.

2/ Not available.

3/ Centrifugal sugar (raw value) of which 44 percent from continental beets, 16 percent continental cane, 20 percent Hawaiian cane, 20 percent Puerto Rican cane, and a small amount of cane from the Virgin Islands.

4/ Centrifugal sugar (raw value), all beet.

5/ US commercial vegetable production only.

6/ US total fruits only, exclusive of berries.

Source: US: (7, 9), USSR: (21) except for USDA estimates.

Table 10.--Number of livestock in the United States and the Soviet Union,
January, 1950-1962

(In millions)

Year	All cattle		Cows ^{1/}		Hogs		Sheep		Horses	
	US	USSR	US ^{2/}	USSR	US	USSR	US	USSR	US	USSR
1950...	78.0	58.1	23.9	24.6	58.9	22.2	29.8	77.6	7.8	12.7
1951...	82.1	57.1	23.6	24.3	62.3	24.4	30.6	82.6	7.0	13.8
1952...	88.1	58.8	23.1	24.9	62.1	27.1	32.0	90.5	6.2	14.7
1953...	94.2	56.6	23.5	24.3	51.8	28.5	31.9	94.3	5.4	15.3
1954...	95.7	55.8	23.9	25.2	45.1	23.3	31.4	99.8	4.8	15.3
1955...	96.6	56.7	23.5	26.4	50.5	30.9	31.6	99.0	4.3	14.2
1956...	95.9	58.8	22.9	27.7	55.4	34.0	31.2	103.3	3.9	13.0
1957...	92.9	61.4	22.3	29.0	51.9	40.8	30.7	108.2	3.6	12.4
1958...	91.2	66.8	21.3	31.4	51.5	44.3	31.2	120.2	3.4	11.9
1959...	93.3	70.8	20.1	33.3	58.0	48.7	32.6	129.9	3.2	11.5
1960...	96.2	74.2	19.5	33.9	59.0	53.4	33.2	136.1	3.1	11.0
1961...	97.3	75.8	19.3	34.8	55.4	58.7	33.0	133.0	3/	9.9
1962...	99.5	82.1	19.2	36.3	57.0	66.7	31.4	137.5	3/	9.4

1/ Included in all cattle.

2/ Two years old and for milk.

3/ Beginning in 1961, estimates were discontinued because the number of horses and mules on U. S. farms have declined to such a low level.

Source: US: (7, pp. 311, 326, 337, 369) and Agricultural Marketing Service, US Department of Agriculture, USSR: (21, p. 381).

old and unproductive livestock are being kept long after their useful life span, and much livestock is poorly fed. Numerous articles in the Soviet press relate large annual losses of livestock from inadequate feed.

This leads to a situation in which one goal conflicts with another. Soviet farmers are required to increase livestock numbers and at the same time fulfill plans for meat production. Apparently one of these must suffer, and in the last 3 years it has been the meat supply. This is especially noticeable when one compares livestock numbers with the production of meat and dairy products during the period 1957-61. (See tables 10, 12, and 13.) According to Soviet data swine numbers have increased substantially in the last decade (table 10) and the Soviet Union now has more swine than the United States. However, Soviet pork production is little more than half that of the United States (table 11) and pork production has not increased substantially, according to Soviet data, since 1957 (table 12). The argument that hog numbers are being built up for future production has little relevance here for two reasons. The Soviet Union already has larger hog numbers than the United States so its base for pork production is adequate, at least numerically. Furthermore, the life span of hogs does not normally warrant their being kept from slaughter, especially male animals, for a period of 5 years, even if hog numbers are being built up.

There are, therefore, a great many contradictions in the Soviet statistics on livestock numbers and meat production. Part of the answer may lie in exaggerated livestock numbers or incorrect meat statistics, part may lie in the obsession of the Soviets with livestock numbers for their own sake, and part may be explained by attempts to build up and improve herds. In any

Table 11.--Production of livestock commodities and finished vegetable oils
in the United States and the Soviet Union

Commodity	Year	United States	Soviet Union	USSR as percent of US
		Million pounds	Million pounds	
Beef and veal	1961	16,341	1/5,090	31
Pork	1961	11,412	1/6,370	56
Mutton, lamb, and goat	1961	832	1/2,040	245
Poultry meat	1961	2/7,338	3/1,984	27
Horse meat	1959	---	3/430	---
Lard	1960	2,568	4/1,170	46
Margarine and shortening	1959	3,861	3/996	26
Tallow and grease	1960	3,827	410	11
Milk, cows	1960	122,920	1/112,500	92
Butter	1960	1,479	3/1,870	126
Wool	1960	5/300	5/787	259
Eggs (billions)	1961	63.7	3/29.3	45

1/ USDA estimates of USSR production.

2/ Includes 5,830 million pounds of chicken and 1,508 million pounds of turkey meat.

3/ USSR official figure.

4/ Includes unrendered pork fat in terms of lard; calculated from pork production.

5/ Greasy basis.

Table 12.--Official Soviet data of total meat production
in the Soviet Union, 1950-61

(Slaughter weight including fat, edible offals and certain waste products)

Year	Total meat	Beef and veal	Pork	Mutton, Lamb and goat	Poultry	Other	Index of total meat production
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	1950=100
1950....	10,730	5,192	3,258	1,521	608	145	100
1951....	1/	1/	1/	1/	1/	1/	---
1952....	1/	1/	1/	1/	1/	1/	---
1953....	12,835	4,608	5,082	1,574	1,131	441	120
1954....	13,847	4,610	5,985	1,548	1,058	630	129
1955....	13,937	4,808	5,575	1,821	1,003	730	130
1956....	14,546	5,176	5,877	1,828	1,047	617	136
1957....	16,257	5,306	7,372	1,713	1,287	578	151
1958....	16,975	5,952	7,275	1,984	1,323	441	158
1959....	19,621	7,055	7,937	2,425	1,543	661	183
1960....	19,180	7,055	7,275	2,425	1,764	661	179
1961....	19,400	6,393	7,937	2,425	1,984	661	181

1/ Not available.

Sources: For 1950-57: (23, p. 159). For 1958-61: (21, p. 304). Soviet data converted from metric tons to million pounds.

Table 13.--USDA estimates of production of four major meats in the Soviet Union, 1950-61

(Slaughter weight)						
Year	Total meat	Beef and veal	Pork	Mutton, lamb and goat	Poultry	Index of total meat production
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	1950=100
1950	7,458	3,125	2,550	1,175	608	100
1951	7,450	3,733	2,767	950	---	100
1952	8,350	4,200	3,000	1,150	---	112
1953	10,106	3,915	3,805	1,255	1,131	135
1954	10,733	3,930	4,495	1,250	1,058	144
1955	10,728	4,093	4,182	1,450	1,003	144
1956	11,322	4,400	4,500	1,475	1,047	152
1957	12,127	4,400	5,000	1,440	1,287	163
1958	13,563	4,700	5,600	1,940	1,323	182
1959	15,193	5,300	6,300	2,050	1,543	204
1960	15,313	5,261	6,253	2,035	1,764	205
1961	15,484	5,090	6,370	2,040	1,984	208

The difference between USDA estimates of Soviet meat production and the official Soviet data results from the inclusion in the Soviet data of fat, as well as products considered waste in the United States and the exclusion from the USDA estimates of all meats except those shown above. The USDA estimates are based on official Soviet livestock numbers. The poultry estimates of the Soviet government are accepted by the USDA.

event, the immediate result has been a large number of poorly fed and poorly cared for livestock, with low milk and meat yields, and consistent underfulfillment of meat production plans.

A glance at table 11 indicates that, except for lamb, on a per capita basis the Soviet consumer has less than half as much meat available as the American consumer.

FOOD CONSUMPTION

In the United States, agriculture provides a plentiful supply of a wide variety of food products. There seems to be little difficulty in increasing the quantity and quality of food products wherever a demand exists. In fact the farm problem in the United States results from the ability of American farmers to produce surpluses. In the Soviet Union, although the diet appears to be adequate in terms of calories (15, p. 15), the variety and quality of foods are limited, and starches predominate in the average diet. Over half the caloric value of the diet is supplied by flour and cereal products, and about a tenth by potatoes. Less than 25 percent of the calories of the average United States diet is from flour, cereal products, and potatoes. Foods of animal origin account for 30 percent of the caloric intake in the United States but for about 15 percent in the Soviet Union (15).

AGRICULTURAL TRADE

Foreign trade in agricultural commodities in the Soviet Union, which is carried out through a government monopoly, has been considerably less important to the economy of the

country and the world since World War I than agricultural foreign trade of the United States. Generally the Soviet Union has aimed to be self-sufficient in its industrial and agricultural production, though it has imported to further industrialization and exported to continue importing. Most of the Soviet Union's agricultural trade since World War II has been with the Communist bloc countries.

In the 7 years 1955 to 1961 agricultural commodities accounted for about 21 percent of total Soviet exports and about 25 percent of total imports. During these same years grains made up 42 percent of total Soviet agricultural exports, and unginned cotton and linters accounted for 28 percent. The Soviet Union also exports relatively small amounts of meat and dairy products, wool and oilcake. Because grains and cotton make up the bulk of Soviet agricultural exports the total value of agricultural exports tends to vary with the domestic production of those commodities.

Soviet agricultural imports are not dominated to as great an extent by one or two commodities. During the period 1955-61 raw rubber imports were the largest item, accounting for 12 percent of total agricultural imports. Raw cotton imports accounted for 11 percent, while edible livestock products and livestock for slaughter accounted for 10 percent. Imports of wool and raw and refined sugar amounted to about 10 percent of total agricultural imports. Vegetables, fruits, oilseeds, tobacco, and coffee are also significant Soviet agricultural imports (24, 25).

The United States is the world's largest exporter and the second largest importer of farm products. Output from 1 out of every 5 acres of harvested cropland in the United States was exported in 1962. During the last decade agricultural exports have been between 20 and 24 percent of total United States domestic exports, and have been valued between 3 to 5 billion dollars.

The United States is a major exporter of grains, cotton, oilseeds, and tobacco and a major importer of coffee, rubber, cocoa, and wool. In recent years the United States has exported, on the average, about half its rice production; two-fifths of its cotton, wheat, and tallow production; about one-third its tobacco, and one-fifth of its soybeans. Grains are the most important U. S. export accounting in recent years for 35-40 percent of the value of total U. S. farm exports.

The United States has accounted for about one-sixth of world agricultural imports in recent years. Coffee is the leading United States agricultural import, with the United States taking more than half the total entering into world trade (12).

PROBLEMS IN COMPARING SOVIET AND UNITED STATES AGRICULTURE

In this report a great many aspects of Soviet and United States agriculture have been compared. Such comparisons assist in understanding how agricultural production is carried out in both countries today and how each utilizes its existing resources to produce its respective agricultural outputs. It is quite apparent, however, that the differences between agriculture in the two countries are so great that comparisons are difficult. Unfortunately comparisons have been used to support at least two false suppositions: that a race is being run between agriculture in these two countries and that the possibilities for expanding agricultural production are greater in the USSR than in the United States.

The Agricultural Production Race

If there is a race it is a one-sided race on the part of the Soviet Government. Farmers in the United States are not trying to outproduce the Soviet Union agriculturally, nor are they

running a race to increase total agricultural production in physical terms. Millions of American farmers producing commodities for the domestic and international market could increase their output if there were increased demand. If, for instance, there was a demand for an increase in the output of potatoes and a profitable price offered, it would be only a relatively short time until the increase would be forthcoming. This productive capacity is in part the explanation for agricultural surpluses in the United States. When the demand for a commodity declines in the United States it is necessary for farmers to curtail production; State and Federal governments attempt to make the adjustments less harsh for the American farmer, but the market still provides the guidelines. The test of success of American agriculture is whether or not it satisfies the demand for agricultural products at reasonable prices while at the same time providing an adequate return to the farmer.

In the Soviet Union, however, agricultural production, like all production, is planned by the Government. Goals are established in physical terms -- so many tons of this and so many tons of that -- and these plans have to be taken as the major component of the "demand" of the economy for agricultural products. Thus, the measure of success of Soviet agriculture is its ability to fulfill Government plans. The fact of the matter is that Soviet agriculture often does not fulfill the goals set for it. For example, according to official Soviet figures, meat production was planned to increase 4 million metric tons in 1962 and it actually increased only 700,000 tons. According to Soviet data meat production did increase in 1962, above the 1959 level and this increase cannot be belittled, but as a measure of Soviet agriculture's ability to respond to the demands placed upon it, it failed miserably. Since 1959, Soviet agriculture has consistently failed to meet planned production goals for almost all commodities. According to Khrushchev himself Soviet agriculture does not provide sufficient food and livestock feed.

The Possibilities for Expanding Production, the Question of "Reserves"

Soviet leaders constantly talk about the great "reserves" possessed by Soviet agriculture and the need for bringing these "reserves" into production. At the same time they claim that American agriculture does not increase production because of its economic system. To illustrate this they point to the great increases in the sown area in the Soviet Union, the great increase in livestock numbers, and the vast areas of unused land in the Soviet Union. In the United States, they argue, the sown area has declined, livestock numbers increase only gradually and net investment in agriculture grows slowly. Since they persist in using the term "reserves" and in making such comparisons, it is well to keep in mind just what the reserves of both countries are, and what these differences really mean.

The United States possesses great agricultural reserves in human and natural resources, knowledge, machinery, and other capital. These are used by American farmers to satisfy their immediate needs most efficiently, and at times they remain unused. For example, on an American farm it is not uncommon to find tractors and different types of machinery which may stand idle during parts of the year. But they can be and are mobilized at peak periods of production and when extra efforts are required. The same is true of land. Over the last few decades a considerable amount of land has been taken out of production in the United States because farmers now produce more on less land, concentrating their efforts on the most productive land. If the demand warrants, much of this unused land can be quickly brought into production, as it was during World Wars I and II. 5/

5/ Agricultural programs of various kinds in 1962 reduced acreage by about 62 million acres. For a much more detailed study of productivity in the United States see (8, 13).

A great deal of the investment in American agriculture today is in more efficient means of production -- land improvement and reclamation, better and more efficient buildings and storage facilities, better herds, more fertilization and improved machinery -- not in increasing the absolute quantity of livestock, buildings, land and equipment. In fact, net additions to total capital investment in American agriculture in recent years have been relatively small (10, p. 56).

When Soviet officials talk about reserves, they have in mind, for the most part, their great land mass (much of which is unsuitable for agriculture), the latent abilities and efforts of their large labor force (which they seem incapable of adequately stimulating), and the machinery and equipment that stands idle in the Soviet Union. Large numbers of tractors and other farm implements do stand idle every year in the Soviet Union, not because they are not needed, but because there are no spare parts, competent mechanics are not available to repair them, or competent operators are not available. This machinery stands idle not only during slack periods, but during peak periods of production. In land utilization, the Soviet Union is continually expanding sown acreage, but increasingly in marginal land, while the more valuable land suffers from inadequate fertilization, poor management, and careless cultivation. Although fertilizer is not plentiful, large amounts of it are wasted every year. Similarly, labor is often very inefficiently utilized, especially in comparison with the United States, and because almost half the Soviet labor force is still employed in agriculture this means that a large segment of the nation's labor force is inefficiently utilized.

These conditions and especially the last complicate agricultural production even under normal conditions and especially during the peak periods of production, periods of unfavorable weather, or when exceptional production increases are required. When unfavorable weather necessitates replanting or a more rapid harvest, a reserve of tractors and machinery cannot be quickly mobilized. Even during normal seasonal peaks in agricultural production the supply of machines in good operating condition is inadequate. Poorly fertilized crops often do not withstand adverse weather as well as those which are better fertilized and cared for. When crops are planted on marginal land there is constantly the possibility of losses due to adverse weather.

Insufficient mechanization and excessive reliance on labor place a dual burden on Soviet agriculture: agriculture constantly faces labor shortages at peak periods while it suffers labor surpluses during slack periods. This reduces the productivity of labor because it is inadequately employed during slack periods, and at the same time the possibilities for expanding agricultural production through intensification are limited because to do so would necessitate considerable additional inputs of labor or capital, or both. 6/

These features of Soviet agriculture have their roots in the history of Soviet agricultural policy. Throughout its almost half-century history, the Soviet government has held the position that industrialization of the country came first, especially the rapid development of heavy industry and armaments. With complete control over the allocation of productive factors it purposefully directed these into industry and away from agriculture and consumer goods. Since agriculture was the major economic sector of the economy it was from agriculture that much of the initial capital for industrialization was drawn. Furthermore, the Soviet Union has been committed to an organizational structure in agriculture which was motivated by political and

6/ During 1953-59, the period of rapid increase in agricultural production, the labor force in agriculture, according to official statistics, increased and did not fall below the 1953 level until after 1959 when agricultural production again returned to stagnation (22, p. 450).

ideological rather than productive objectives. From the early 1930's until the early 1950's this organizational structure was used as a tool for extracting from agriculture the largest possible quantities of agricultural foodstuffs and raw materials at the least possible cost to the state.

It is impossible to measure the impact of these factors upon Soviet agriculture. Undoubtedly it has been great, owing to the decades of draining resources from agriculture with very little compensation, withholding from agriculture the necessary productive inputs, and most particularly the drain from agriculture of some of its best human resources, both labor and managerial. These things have left Soviet agriculture the residual claimant of the fruits of Soviet industrialization. According to the Soviet's own production indices, production in heavy industry rose from 100 in 1913 to 1,048 by 1940 and by 1961 was 63 times larger than in 1913. Their index indicates, however, that agriculture increased from 100 in 1913 to 141 in 1940 and was less than 2 1/3 times greater in 1961 than 1913 (21, p. 65). 7/ Despite the lack of good housing and other facilities in Soviet cities the constant flow of people to these cities and the difficulties encountered in keeping people in agriculture reflect the relatively poor living conditions and opportunities in Soviet agriculture.

Agricultural production undoubtedly could be increased and the vast labor force in Soviet agriculture could be more efficiently employed if significant organizational and managerial changes were made, the incentives to individual agricultural workers and managers were increased and greater amounts of capital were supplied to agriculture. In this sense there are still considerable "reserves" in Soviet agriculture. Low crop yields and labor productivity could be raised, even though not as fast or as high as is often demanded by Soviet planners, because of climatic obstacles. Some measures to improve the economic environment and the institutional structure of Soviet agriculture taken during the post-Stalin era, accompanied by a large increase in the sown area, and by several years of good weather resulted in a significant increase of production by 1958. But such measures did not go far enough and in some respects a retrogression took place after 1958. This, in conjunction with several years of no-better-than-average or poor weather, has led to a stagnation of agricultural production, in spite of the Government's plans for rapid expansion.

7/ In a period of rapid industrialization the rate of growth of industrial production should exceed that of agricultural production, but agricultural output must grow at least at a reasonable pace if food shortages or heavy imports of foodstuffs are to be avoided and agriculture is not to be a drag on the entire economy.

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